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RESEARCH AID

ESTIMATED FLOORSPACE OF
SARATOV AIRFRAME PLANT NO. 292



CIA/RR RA-14

22 July 1957

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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(ORR Project 33.1718)

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FOREWORD

This research aid, one of a series evaluating current floorspace of Soviet airframe plants of the Ministry of the Aviation Industry (Ministerstvo Aviatsionnoy Promyshlennosti -- MAP), is based on metrical analysis* of World War II German photography. Supplementary intelligence data also have been used in an attempt to ascertain the composition and functions of the individual plant buildings. An effort has been made to determine the areas of the plant which are multi-story, and the latest information on new construction has been included. This research aid will be reviewed and reissued periodically to include new intelligence information as available.

* Determination of measurements on aerial photographs.

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ESTIMATED FLOORSPACE OF SARATOV AIRFRAME PLANT NO. 292*

Summary

Saratov Airframe Plant No. 292 in the USSR originally was named Kombain Zavod. This plant has a minimum of 1.7 million square feet (sq ft) of floorspace** and a final assembly area of approximately 280,000 sq ft, about 17 percent*** of the total floorspace. The administration area of the plant comprises about 220,000 sq ft, or 13 percent of the total floorspace. (One 4-story administration building contains 200,000 sq ft of the administration floorspace.) It is estimated that there are 150,000 sq ft of warehouse area**** in the plant, approximately 9 percent of the total floorspace. There are no known basement areas in the plant. Covering an over-all area estimated at 6 million sq ft, the plant has a building density† of about 22 percent.

Located north of the railroad in the north-northwest section of the plant are about 21 buildings which are not included in the total floorspace given in this research aid. Five buildings located on Saratov South Airfield, southwest of Saratov Airframe Plant No. 292,

* The estimates and conclusions contained in this research aid represent the best judgment of ORR as of 1 June 1957.

** All figures dealing with square footage are rounded to two significant digits.

*** All percentages are computed with actual figures.

**** The term warehouse is applied to those buildings or areas in the plant which have the primary functions of receiving materials from external sources and of holding these materials in bulk quantities for subsequent distribution to the processing points in the plant.

The term storage areas is applied to those building or areas, usually parts of buildings which have primary functions other than storage, in which materials are stored or maintained for the direct support of production or service activities. These areas normally are located adjacent to the activities which they support, and they receive their stores from plant warehouses.

† The term building density represents the proportion of the total roof area of an airframe plant to the total plant site, expressed as a percentage.

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are included in the total floorspace. Reports of reliable observers and analysis of building configurations indicate that these buildings probably are used for post assembly.* These buildings contain approximately 85,000 sq ft of roof area. (See Appendix A.)

1. Location.

Saratov Airframe Plant No. 292 (51°30' N - 45°57' E) is located in the USSR, approximately 3 nautical miles southwest of the center of Saratov and 3,000 feet west of the Volga River. It is approximately 2,700 feet north of the Saratov South Airfield and 4.6 nautical miles north-northwest of the Saratov Railroad Bridge over the Volga River.

2. History.

Saratov Airframe Plant No. 292, originally named Kombain Zavod, was built in 1931-32 for the production of agricultural machinery. The plant produced only combines and related farm implements until 1938, when partial conversion to production of aircraft took place. In March 1952, Plant No. 292 received additional equipment for production of aircraft from Plant No. 165 in Dnepropetrovsk.

Although production of aircraft at Saratov Airframe Plant No. 292 has been continuous since 1938, consumer goods have also been produced periodically by the plant. Aluminum items, toys, and kitchen utensils are listed among the items produced. By 1949, Plant No. 292 was engaged in the production of jet aircraft.

3. Description.

The plant site of Saratov Airframe Plant No. 292 is roughly L-shaped, with the longer axis oriented toward the northwest and the

* Post assembly is considered to be that stage of production of an aircraft after it has been "shop completed" in the final assembly area. Post assembly consists of the fitting out of an aircraft for final acceptance. Fitting out in this sense pertains to, but is not limited to, the following operations: check of electronic equipment; testing of fuel flow and calibration; testing of engine performance; orientation of navigation equipment; preflight testing of oxygen systems, hydraulic lines, lubricants, and batteries; and factory flight testing.

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shorter axis toward the northeast. (See Figure 1.*) The plant covers an area of roughly 6 million sq ft. Analysis of World War II photography (see Figure 2*) dated April 1943, reveals a total estimated roof area of approximately 1.3 million sq ft. Available information indicates that as of April 1943 there were, in addition, 350,000 sq ft of multistory area enclosed within the plant. Total floorspace at the plant at the end of World War II, therefore, is estimated to have been approximately 1,650,000 sq ft.

As late as 1947 a section of the area was used as a camp for prisoners of war. This section contained guard towers and living quarters and was fenced off from the plant site. 1/** Interrogation reports of German prisoner-of-war returnees make no mention of this area as part of the plant site. Recent observations by reliable observers have indicated that this area probably is being utilized as a housing site. Analysis of the roof area of these buildings indicated a total of 68,000 sq ft of roof area. 2/

Information on the only new postwar construction reported is conflicting. Pending clarification, it has been estimated that new construction totaling approximately 25,000 sq ft was nearing completion in June 1956. The total plant floorspace, therefore, is estimated to be about 1.7 million sq ft. (See Appendix A.) The plant has a building density of 22 percent.

An area for potential limited expansion appears to exist within the northeast arm of the factory site. (See Figure 1.*) No evidence has been reported of contemplated significant expansion of production facilities.

The major buildings appear to be constructed either of steel frame and sheet metal or of brick. Types of roofs vary both in design (gable, flat, and monitor) and in materials (concrete and sheet metal). (See Figure 3.*)

* Following p. 4.

** For serially numbered source references, see Appendix D.

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The Saratov South Airfield is used as a test and flyaway field for Saratov Airframe Plant No. 292, and five buildings located on the airfield are included in the total floorspace.

4. Final Assembly Area.

Analysis of World War II photography indicates that the final assembly area of Saratov Airframe Plant No. 292 is composed of 1 shop-type building 725 feet long by 385 feet wide. This building, Building No. 9, contains approximately 280,000 sq ft, or 17 percent of the total floorspace, with no reported basement or multistory areas. The shop roof is flat with numerous transverse monitors. At the eaves the roof is 30 feet in height. There is no intelligence information available either on the internal layout of the building or on recent changes in its configuration.

The possibility exists that, during and immediately after World War II, Building No. 12, which is 610 feet long and 270 feet wide, was used as the final assembly area. (See Figure 1.*) It appears probable, however, that as of January 1957 this building contained workshops.

5. New Construction.

Two reports of new construction activity at Saratov Airframe Plant No. 292 based on observations of reliable sources in December 1954 and in June 1956 have been received. Although the reports apparently relate to the same new extension, their descriptions of this extension differ sufficiently to make a firm determination of its scope and exact location impossible.

The 1954 report stated that new construction was seen in the western corner, where a "4-bay block of sheds approximately 80 yards by 35 yards was being erected." 3/ The 1956 report noted that in the same area "four new buildings" running perpendicular to the road were almost completed. 4/ This report stated that "the buildings are estimated to be 500 feet long and possibly 75 feet wide."

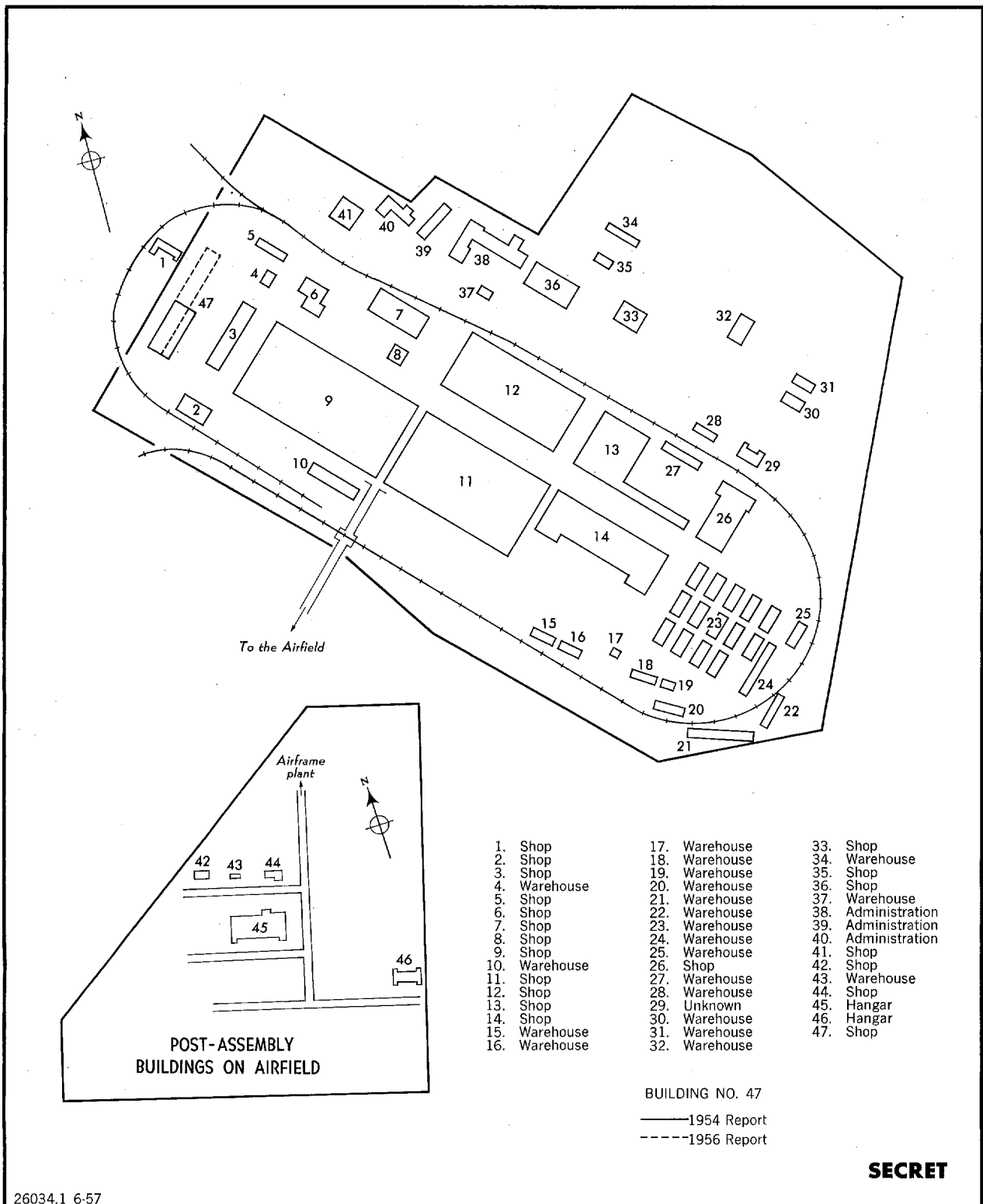
Because of the discrepancy in the reports, it was decided to base analysis on the assumption that 1 new building 80 yards long by 35 yards wide was constructed. This building is located in the north-west area of the plant, inside the northern loop of the railroad track between Building No. 1 and Building No. 3. (See Figure 1.*) It is assumed that the new building is being used in a shop-type function.

* Following p. 4.

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Figure 1

USSR: SARATOV AIRFRAME PLANT NO. 292



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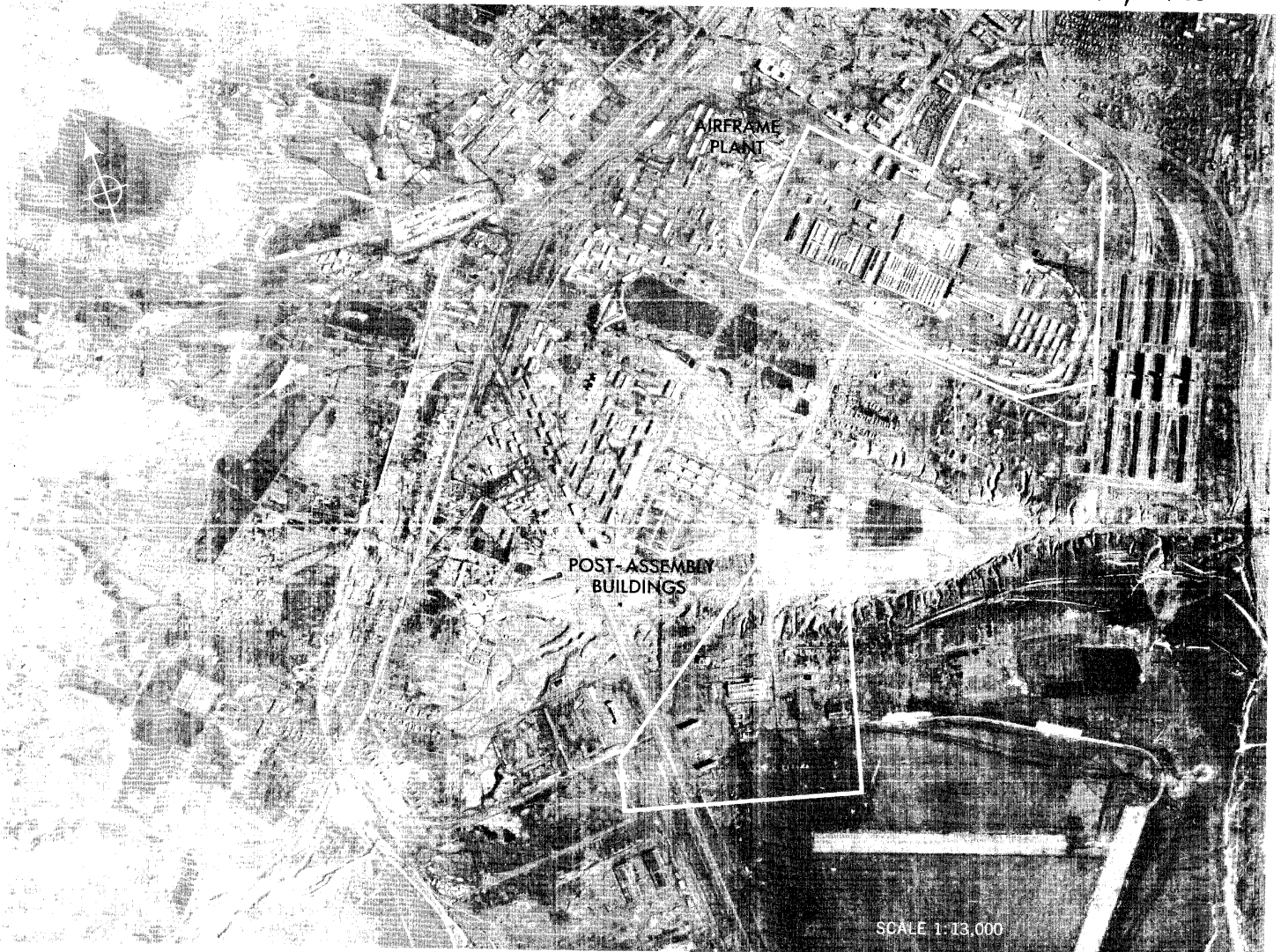
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USSR: VERTICAL PHOTOGRAPH OF SARATOV AIRFRAME PLANT NO. 292, 1943

Figure 2

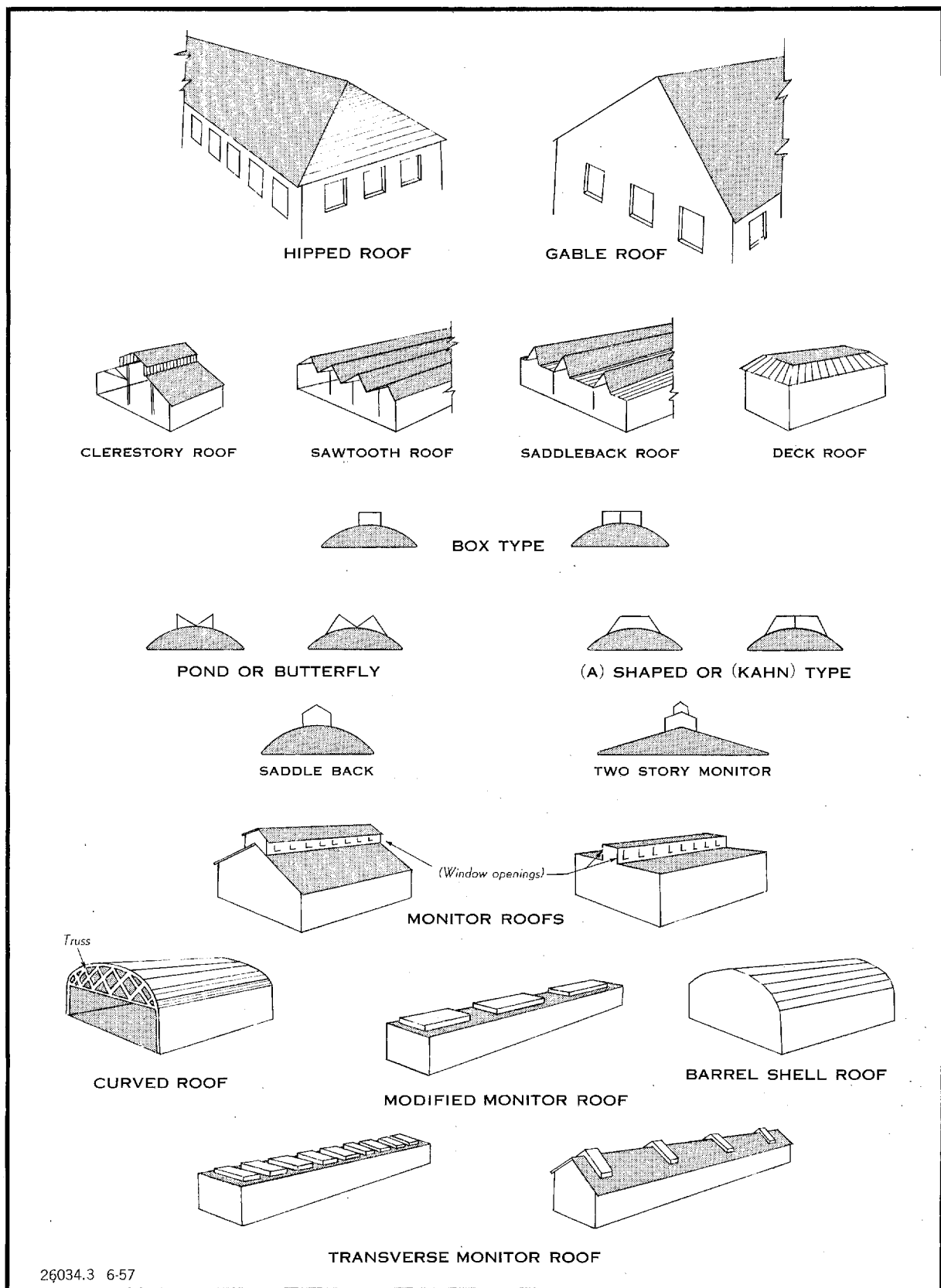


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TYPES OF ROOFS

Figure 3



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APPENDIX B

METHODOLOGY

On the basis of available intelligence an effort was made to determine the function of each building in Saratov Airframe Plant No. 292, to identify multistory plant areas, and to account for new plant construction. All buildings within the plant site, except sheds with areas less than 500 sq ft, are listed in Appendix A.*

German vertical photographs of 1943 were used to determine the roof area and the physical layout of the plant. Metrical analysis of this photography provided an estimate of the total roof area of the plant. In computing this total, no allowance could be made for multistory buildings. To compensate for this factor, intelligence information, consisting chiefly of prisoner-of-war interrogation reports, was used. Although this category of information is often considered unreliable, plausible data from this source were used to determine the functions of plant buildings and, in some cases, to account for multistory areas. Whenever building functions were unknown, the best judgment of the analyst was used to provide an estimate.

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Estimates of new construction are based on observations [REDACTED]. There is no reported evidence of multistory areas within the new construction.

To obtain the total floorspace, the total roof area was added to the multistory area. The administration area accounted for 13 percent and the warehouse area for 9 percent of the total floorspace of the plant.

* P. 5, above.

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APPENDIX C

GAPS IN INTELLIGENCE

The accuracy of the estimates of the floorspace of Saratov Airframe Plant No. 292 is greatly impaired because of the paucity of information. German vertical photographs of 1943 are available, however, and from the photographs the roof area and the physical layout of the plant as it was in April 1943 can be computed. Lack of current vertical photography precludes further study of the plant by this means.

Helpful information was obtained from interrogations of German prisoner-of-war returnees. Unfortunately, these returnees generally were restricted to the warehouse areas of the plant, and reports of their observations of the remainder of the factory area are vague and incomplete.

Information pertaining to multistory areas within the plant is virtually nonexistent. Because estimates of floorspace in multistory areas greatly affect the estimate of total floorspace, acquisition of this information is of prime importance. The lack of oblique ground photography hinders the determination of building heights and designs, and the lack of both vertical and ground oblique photography hinders analysis of new construction in the plant. Details of the final assembly area and reliable information concerning the composition of other essential buildings likewise are not available.

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APPENDIX D

SOURCE REFERENCES

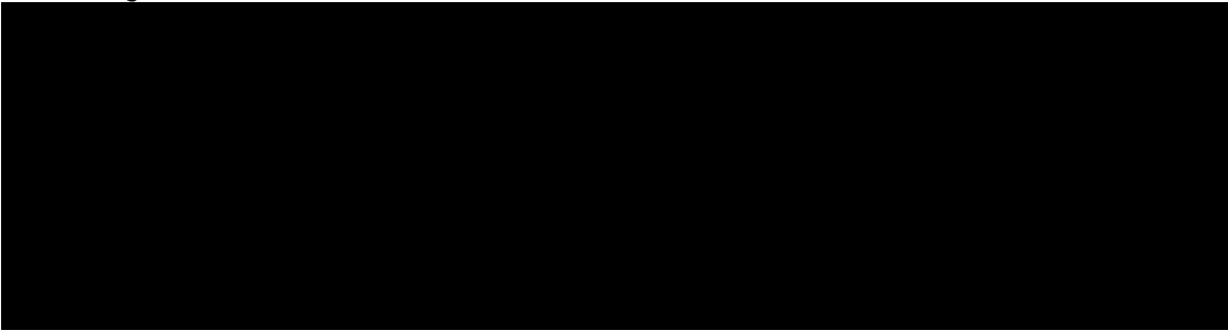
Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this research aid. - No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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